Day 89

Q. You are given N integers. In each step you can choose some K of the remaining numbers and delete them, if the following condition holds: Let the K numbers you've chosen be a1, a2, a3, ..., aK in sorted order. Then, for each i ≤ K - 1, ai+1 must be greater than or equal to ai * C. You are asked to calculate the maximum number of steps you can possibly make.

main.cpp

```
#include <bits/stdc++.h>
#define ll long long
#define INF 1e18
using namespace std;

vector<ll> nums;
int T, N, K, C;
int lo, mid, hi, X;

bool check(int L) {
    vector<ll> v[L];
    int i=0;

    for(auto num: nums) {
        if(v[i].size()==K) {
            break;
        }
        if(v[i].size()==0 || ( v[i].back()<INF/C && v[i].back()*C<=num)) {
            v[i].push_back(num);
            i = (i+1)%L;
        }
    }

    return v[L-1].size() == K;
}

int main() {
    ll num;
    cin>>T;

    while(T--) {
        cin>>N>>K>>C;
        nums.clear();
        while(N--) {
            cin>>num;
            nums.push_back(num);
        }

        sort(nums.begin(), nums.end());
```

```
        X = 0;
        lo = 1;
        hi = nums.size()/K;

        while(lo<=hi) {
            mid = (lo+hi)/2;
            if(check(mid)) {
                X = mid;
                lo = mid+1;
            }
            else {
                hi = mid-1;
            }
        }
        cout<<X<<endl;
    }
    return 0;
}
```

output